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Sarah Anne Hews* (sarah.hews@asu.edu), Mathematical and Statistical Sciences, Arizona State University, Tempe, AZ 85281. *Capturing the Dynamics of Hepatitis B.*

Chronic hepatitis B (HBV) infection is a major cause of human suffering, and a number of mathematical models have examined within-host dynamics of the disease. An effective HBV mathematical model should exhibit four states: a disease free state, an acute infection state, a chronic infection state, and an acute liver failure state. Most previous models are based on assumptions that contradict experimental data, provide problematic basic infection numbers, and only yield a disease free and a chronic infection steady state. Specifically, these models assume that there is a constant influx of healthy hepatocytes and that infection takes place via mass action. This talk will present a model that includes a logistic growth term for hepatocytes and a standard incidence function for infection transmission. These simple changes produce a model that has a disease free state, a chronic infection state with hepatocyte oscillations, and an acute liver failure state. Parameter regimes for these states and techniques used to evaluate the non-differentiable liver failure state will be explored. Finally, preliminary models that also include an acute infection state will be presented. (Received February 06, 2009)